

First Hit

L1: Entry 1 of 2

File: JPAB

Nov 21, 1995

PUB-NO: JP407304683A
DOCUMENT-IDENTIFIER: JP 07304683 A
TITLE: LIPID METABOLISM-PROMOTING AGENT

PUBN-DATE: November 21, 1995

INVENTOR-INFORMATION:

NAME

COUNTRY

KOMINATO, JO

NISHIMURA, SHOJI

TOMONAGA, TADAHIRO

NISHIMI, TOMOYUKI

ASSIGNEE-INFORMATION:

NAME

COUNTRY

RIKEN HEALTH KK

APPL-NO: JP06120522

APPL-DATE: May 9, 1994

INT-CL (IPC): A61 K 35/78; A61 K 35/78

ABSTRACT:

PURPOSE: To prepare a lipid metabolism-promoting agent containing a garlic essential oil, an allyl sulfide compound, a garlic processed product, and a garlic extract ingredient as active ingredients.

CONSTITUTION: The lipid metabolism-promoting agent contains a garlic essential oil, an allyl sulfide compound, a garlic processed product, and a garlic extract ingredient, which are obtained by the below-described methods, as active ingredients and has an effect as an antiobesic agent because of having a fat metabolism-promoting action. (1) The garlic essential oil is obtained by removing skins from garlicks and subsequently subjecting the garlicks to a steam distillation treatment. (2) The allyl sulfide compound is obtained by purifying the garlic essential oil. (3) The garlic processing product is obtained by heating garlic flakes and simultaneously grinding the heated garlic flakes. (4) The garlic extract is obtained by deactivating enzymes contained in garlicks, extracting the treated garlicks with ethanol, subjecting the extract to an adsorption and a desorption treatment), powdering the treated extract, and subsequently heating the powdered extract.

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End of Result Set

L1: Entry 2 of 2

File: DWPI

Nov 21, 1995

DERWENT-ACC-NO: 1996-035834

DERWENT-WEEK: 199604

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TITLE: Lipid metabolism stimulator - contains essential oil of garlic of allyl sulphide(s), or dried and heat treated garlic.

PATENT-ASSIGNEE: RIKEN HEALTH KK (RIKEN)

PRIORITY-DATA: 1994JP-0120522 (May 9, 1994)

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PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<input type="checkbox"/> JP 07304683 A	November 21, 1995		004	A61K035/78

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
JP 07304683A	May 9, 1994	1994JP-0120522	

INT-CL (IPC): A61 K 35/78

ABSTRACTED-PUB-NO: JP 07304683A

BASIC-ABSTRACT:

Lipid metabolism stimulator contains an essential oil of garlic or allylsulphides, dried and heat treated garlic, or heat treated water or dilute EtOH extract of enzyme inactivated garlic.

Pref lipid metabolism stimulators comprise (1) an essential oil obtd by steam distn of peeled garlic, (2) allylsulphides purified from the essential oil of garlic, (3) pulverised heat treated flakes of garlic, or (4) garlic extract obtd by inactivation of enzyme in garlic, EtOH extn, absorption and desorption, pulverisation and heat treatment.

USE - Used for stimulation of lipid metabolism without side reaction.

In an example, in urethane-alpha-chloralose an anaesthetised male Wistar rats, body wt of 210-230 g, (A) 0.12, (B) 0.24 or (C) 0.36 g of the extract was intravenously administered and blood catecholamine (CA) and norepinephrine (NE) concns were determined. Gp (A) showed (CA) 0.991 +/- 0.239 and (NE) 1.367 +/- 0.779 ng/ml, respectively. Gp (B) showed (CA) 1.953 +/- 0.265 and (NE) 1.538 +/- 1.052 ng/ml, respectively. Gp (C) showed (CA) 3.380 +/- 0.786 and (NE) 5.310 +/- 1.280 ng/ml, respectively.

ABSTRACTED-PUB-NO: JP 07304683A

EQUIVALENT-ABSTRACTS:

CHOSEN-DRAWING: Dwg.0/0

DERWENT-CLASS: B04

CPI-CODES: B04-A10; B04-B01C1; B14-E11;

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 07-304683

(43)Date of publication of application : 21.11.1995

(51)Int.Cl.

A61K 35/78
A61K 35/78

(21)Application number : 06-120522

(71)Applicant : RIKEN HEALTH KK

(22)Date of filing : 09.05.1994

(72)Inventor : KOMINATO JO
NISHIMURA SHOJI
TOMONAGA TADAHIRO
NISHIMI TOMOYUKI

(54) LIPID METABOLISM-PROMOTING AGENT

(57)Abstract:

PURPOSE: To prepare a lipid metabolism-promoting agent containing a garlic essential oil, an allyl sulfide compound, a garlic processed product, and a garlic extract ingredient as active ingredients.

CONSTITUTION: The lipid metabolism-promoting agent contains a garlic essential oil, an allyl sulfide compound, a garlic processed product, and a garlic extract ingredient, which are obtained by the below-described methods, as active ingredients and has an effect as an antiobesic agent because of having a fat metabolism-promoting action. (1) The garlic essential oil is obtained by removing skins from garlies and subsequently subjecting the garlies to a steam distillation treatment. (2) The allyl sulfide compound is obtained by purifying the garlic essential oil. (3) The garlic processing product is obtained by heating garlic flakes and simultaneously grinding the heated garlic flakes. (4) The garlic extract is obtained by deactivating enzymes contained in garlies, extracting the treated garlies with ethanol, subjecting the extract to an adsorption and a desorption treatment), powdering the treated extract, and subsequently heating the powdered extract.

LEGAL STATUS

[Date of request for examination]

07.05.2001

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than
the examiner's decision of rejection or
application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's
decision of rejection]

[Date of requesting appeal against examiner's
decision of rejection]

[Date of extinction of right]

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3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] The lipid metabolism accelerator which makes garlic essential oil an active principle.

[Claim 2] The lipid metabolism accelerator which makes an allyl compound sulfide compound an active principle.

[Claim 3] The lipid metabolism accelerator which heats the desiccation garlic which transforms itself from a garlic, rinses, carries out a fragment, and is obtained by carrying out low-temperature desiccation, and is obtained and which makes a garlic workpiece an active principle.

[Claim 4] The lipid metabolism accelerator which extracts by water or diluted ethanol, heats the extract used as the powder after adsorption and desorption, and is obtained after carrying out enzyme deactivation of the garlic and which makes a garlic extract component an active principle.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the lipid metabolism accelerator and the food for lipid metabolism promotion which make an active principle the garlic workpiece or garlic extract component containing many garlic essential-oil components, allyl compound sulfide compounds, and allyl compound sulfide compounds.

[0002]

[Description of the Prior Art] A garlic is one of the spices used by human beings most for many years, and current is large all over the world, it is grown, and it is used. Moreover, the garlic is known more from ancient times as a nutrient, and sthenia, strong energy, anti-cold, anti-tuberculosis, an anti-parasite, anti-*****, a makeup operation, etc. are known as the effectiveness, and it considers as edible and also is used as moxa cautery or for bath.

[0003]

[Problem(s) to be Solved by the Invention] Obesity is in the condition which neutral fat accumulated in fat tissue, especially a hypodermic fat tissue part unusually in many cases, and weight increased beyond the skeletal system or the limitation of a physiological function, and is the result of not performing lipid metabolism well. general -- 20% or more of standard weight -- increasing -- ****. The subcutaneous adipose tissues which a fat accumulates are a thorax, a femoral region, an abdomen, etc. There are many things of exogenism or simplicity as a cause of obesity, and the ** is dressed by overeating and the lack of movement.

[0004] A present-day lifestyle has many opportunities of overeating, and there are few opportunities of movement on the contrary, therefore there is little consumption of energy. The fat metabolism is not well performed from this, but unusual are recording of neutral fat is caused, and this is set to one of the causes of obesity. On the other hand, obesity is said to cause a vicious circle by inferiority, stress, etc., and tends to cause diseases, such as diabetes mellitus, crown top arteriosclerosis, cholelithiasis, a fatty liver, and *****, as complication by them.

[0005] Although it is an important problem to improve obesity by the above, the present condition is that useful drugs are not conventionally developed even if the improvement of the obesity by medication has fear of habituation, iatrogenesis poisoning, and kidney complication and it sees after this.

[0006] It takes in simply in daily eating habits from this, and development of the approach of contributing for the improvement of the obesity by lipid metabolism promotion is desired. Therefore, this invention persons performed patent application (Japanese Patent Application No. 3-222498) about the garlic workpiece and the garlic extract component as an anti-obesity agent previously.

[0007]

[Means for Solving the Problem] It found out the activity of the sympathetic nervous system being further caused in research with the allyl compound sulfide compound which is one of a garlic essential-oil component, a garlic workpiece, and the garlic extract components in piles, and this invention persons accelerating catecholamine (epinephrine, norepinephrine) secretion, and promoting lipid metabolism.

[0008] By heating the previous garlic workpiece and previous garlic extract component of patent application, this invention discovered that the anti-obesity effectiveness became it remarkably high "To boil that an allyl compound sulfide compound increases", and completed this invention.

[0009]

[Function] The example of an experiment about the following promotion of catecholamine secretion explains the effectiveness acquired by this invention.

[0010] Example of experiment 1. SD system male rat of 4 weeks old was medicated with the high fat food which added respectively desiccation powder-like a garlic workpiece and a garlic extract component 0.8% for 28 days by pair feeding with control foods (high fat food which does not add a garlic). The rat was anesthetized by urethane-alpha chloralose after administration, and it collected blood from the abdominal aorta. The amount of catecholamine secretion in blood measured with internal standardization using the high performance chromatography which connected the electrochemical detector.

[0011] The inclination, as for the amount of catecholamine secretion, for a garlic workpiece and a garlic extract component diet group to show a high value to a control diet group was seen as a result of measurement.

[0012] Example of experiment 2. With a weights [210-230g] SD system male rat was anesthetized by urethane-alpha chloralose, three kinds of garlic extract component solutionsg [g / 0.12 / (a), g / 0.24 / (b), or / 0.36] (c) Containing the garlic workpiece solution and garlic extract component containing 0.12g of garlic workpieces were respectively poured in from the femoral vein with the vehicle, and it collected blood from the postabdomen section main artery for 10 minutes. In addition, the measuring method of the amount of catecholamine secretion in blood containing the amount equivalent to the garlic one-day intake of a rat of a garlic workpiece solution and a garlic extract component solution (a) is the same as that of experiment 1.

[0013] The result of measurement is as in Table 1, and the inclination for the amount of catecholamine secretion in blood to become high to a vehicle about the amount of norepinephrine secretion was seen. Moreover, impregnation of a garlic extract component solution showed the high value intentionally to the vehicle in the amount of norepinephrine secretion by (b) and (c). Moreover, in proportion to the dose, the high value was shown in order of (a) < (b) < (c), and it was also admitted that these had a significant correlation at 1% or less of level of significance. Moreover, as a result of conducting the same experiment to the rat which intercepted the sympathetic nerve activity by phentolamine administration, the amount sthenia of catecholamine secretion in blood by impregnation of a garlic workpiece and a garlic extract component solution was not accepted.

[0014]

[Table 1]

ラット血中カテコラミン分泌に関するにんにく加工品及びにんにく抽出成分の
効果 (数値は平均±標準誤差)

	ノルエピネフィリン (ng/ml)	エピネフィリン (ng/ml)
ベヒクル	0.996±0.158	1.128±0.330
にんにく加工品	1.505±0.429	4.755±0.931*
にんにく抽出成分		
a (0.12g)	0.991±0.239	1.367±0.779
b (0.24g)	1.953±0.265*	1.538±1.052
c (0.36g)	3.380±0.786**	5.310±1.280**

* $p < 0.01$ ** $p < 0.05$ [0015] Example of experiment 3. With a weights [210-230g] SD system male rat was anesthetized by urethane- α chloralose, and about each solution of diaryl monosulfide, a diallyl disulfide, and diaryl trisulfide, 10mmol(s) were respectively poured in from the femoral vein with the vehicle, and it collected blood from the postabdomen section main artery for 10 minutes. The measuring method of the amount of catecholamine secretion in blood is the same as that of experiment 1.

[0016] It is as the result table 2 of measurement, and the amount of catecholamine secretion in blood showed the high value intentionally in a diallyl disulfide and diaryl trisulfide to the vehicle about the amount of norepinephrine secretion. Moreover, it was shown that the amount of norepinephrine secretion becomes high-like proportionally at the sulfur atomic number by which the relation between the amount of norepinephrine secretion and an allyl compound sulfide compound is included in the allyl compound sulfide compound.

[0017]

[Table 2]

ジアリルスルフィド化合物の静脈注入効果 (数値は平均±標準誤差)

	ノルエピネフィリン (ng/ml)	エピネフィリン (ng/ml)
ベヒクル	0.772±0.645	4.403±2.473
ジアリルモノスルフィド	0.513±0.282	10.375±7.717
ジアリルジスルフィド	1.279±0.303	2.550±0.930
ジアリルトリスルフィド	2.165±0.309	5.682±1.183

[0018] Example of experiment 4. With a weights [210-230g] SD system male rat was anesthetized by urethane- α chloralose, three kinds of solutions which contain 0.55mg, 1.10mg, or 1.64mg for a diallyl disulfide were respectively poured in from the femoral vein with the vehicle, and it collected blood from the postabdomen section main artery for 10 minutes. In addition, the solution containing 0.55mg of diallyl disulfides contains the amount which is mostly equivalent to the an average of one day intake of garlicks of a rat. The measuring method of the amount of catecholamine secretion in blood is the same as that of experiment 1.

[0019] The amount of catecholamine secretion in blood showed the high value intentionally to the vehicle by impregnation (1.10mg and 1.64mg) as a result of measurement. Moreover, the amount of norepinephrine secretion showed the high value in 0.55mg < 1.10mg < 1.64mg order in proportion to the dose of a diallyl disulfide, and it was also admitted that these had a significant correlation at 0.1% or less of level of significance. Moreover, as a result of conducting the same experiment to the rat which intercepted the sympathetic-nervous-system activity by FENITO lamin administration, the catecholamine supersecretion in blood by impregnation of a diallyl disulfide was not accepted.

[0020] By the above, administration of the garlic essential-oil component and garlic to a high fat food intake rat makes the peripheral sympathetic-nervous-system activity of a rat cause with the allyl compound sulfide compound contained in it, and accelerates catecholamine secretion, and it is thought that this is promoting lipid metabolism.

[0021] In addition, each matter obtained in the following examples 3 and 4 contains many allyl compound sulfide compounds compared with elegance conventionally, and the promotion operation of lipid metabolism was guessed also about these.

[0022] Example of experiment 5. As a result of performing gas chromatography about the garlic workpiece and garlic flake (control) which were obtained in the after-mentioned example 3 and carrying out comparison examination about head space vapor, as shown in Table 3, it was clear that the garlic workpiece's many diaryl sulfides are included to control.

[0023]

[Table 3]

にんにく加工品のジアリルスルフィド化合物

	コントロール	にんにく加工品
ジアリルモノスルフィド	761	17237(22.7)
ジアリルジスルフィド	1336	2161(1.6)
ジアリルトリスルフィド	523	836(1.6)

The inside of () shows a garlic workpiece / control.

[0024] Example of experiment 6. As a result of performing gas chromatography about the garlic extract component obtained in the after-mentioned example 4, and the no odor garlic end of commercial (control) and comparing about head space vapor and n-hexane extract section, as shown in Table 4, it was clear that the garlic extract component's many diaryl sulfides are included compared with control in any case.

[0025]

[Table 4]

にんにく抽出成分のジアリルスルフィド化合物

	ヘッドスペース		n-ヘキサン抽出部	
	コントロール	にんにく抽出成分	コントロール	にんにく抽出成分
ジアリルモノスルフィド	154	2998(19.1)	-	1273
ジアリルジスルフィド	228	2472(10.8)	157	2271(14.5)
ジアリルトリスルフィド	133	1036(7.8)	141	3625(27.1)
ジアリルテトラスルフィド	-	-	-	544

The inside of () shows a garlic extract component / control.

[0026]

[Example]

Example 1. Solvent extraction of the distillate which transformed itself, rinsed, sliced and performed steam distillation was carried out, the solvent was removed, and garlic essential oil was obtained. The acute toxicity test of this article was fifty percent lethal dose=420mg/kg in internal use by the mouse.

[0027] Example 2. The allyl compound sulfide compound refined by performing vacuum distillation or a column chromatography in the garlic essential oil obtained in the example 1 was obtained. The acute toxicity test of a diallyl disulfide was fifty percent lethal dose=320 mg/kg in internal use by the mouse.

[0028] Example 3. It transforms itself, rinses and slices and the garlic flake comparatively manufactured by drying at low temperature is heated at 110-120 degrees C. After the cold, it carried out the grinding and screen exception and the garlic workpiece which is desiccation powder was obtained. The acute toxicity test of this article was more than fifty percent lethal dose=40 g/kg in internal use by the rat.

[0029] Example 4. Vacuum concentration of the adsorption and desorption by activated carbon etc. was performed and carried out about what added and extracted about 30% of ethanol to the garlic to which thermal inactivation of a self-renewal, rinsing, and the enzyme was carried out, the powder obtained by drying further was heated at 90-105 degrees C, it carried out the grinding-after the cold, and screen exception, and the garlic extract component which is desiccation powder was obtained. The acute toxicity test of this article was more than fifty percent lethal dose=40 g/kg in internal use by the rat.

[0030]

[Effect of the Invention] By this invention, a header and a side effect are not in the garlic workpiece or garlic extract component contained so much in garlic essential oil, the allyl compound sulfide compound contained in it, and an allyl compound sulfide compound about a lipid metabolism promotion operation, either, and an effective lipid metabolism accelerator can be manufactured.

[Translation done.]

(19)日本国特許庁 (J P)

(12) 公 開 特 許 公 報 (A)

(11)特許出願公開番号

特開平7-304683

(43)公開日 平成7年(1995)11月21日

(51)Int.Cl.⁶

A 6 1 K 35/78

識別記号

ADN V 8217-4C

ACN

庁内整理番号

F I

技術表示箇所

審査請求 未請求 請求項の数4 F D (全 4 頁)

(21)出願番号 特願平6-120522

(22)出願日 平成6年(1994)5月9日

(71)出願人 391039830

リケンヘルス株式会社

京都府京都市伏見区深草向川原町48番地

(72)発明者 小湊 境

京都市左京区下鴨萩ケ垣内町31番地

(72)発明者 西村 昇二

京都市山科区西野岸ノ下町37番地

(72)発明者 友永 忠広

京都市西京区大枝北福西町2丁目19番12号

(72)発明者 西見 智之

滋賀県大津市仰木の里7丁目11番地11号

(54)【発明の名称】 脂質代謝促進剤

(57)【要約】

【目的】 にんにく精油、アリルスルフィド化合物、
にんにく加工品及びにんにく抽出成分を有効成分とする
脂質代謝促進剤。

【構成】 下記の製造法で得たにんにく精油、アリル
スルフィド化合物、にんにく加工品及びにんにく抽出成
分は脂肪代謝促進作用があるので、抗肥満剤として効果
を有する。

(1) にんにくを脱皮し、水蒸気蒸留して得たにんに
く精油。

(2) にんにく精油より精製されたアリルスルフィド
化合物。

(3) にんにくフレークを加熱した後粉末としたにん
にく加工品。

(4) にんにくを酵素失活した後、エタノール抽出
し、吸脱着後粉末とした抽出物を加熱して得たにんに
く抽出物。

【特許請求の範囲】

【請求項1】 にんにく精油を有効成分とする脂質代謝促進剤。

【請求項2】 アリルスルフィド化合物を有効成分とする脂質代謝促進剤。

【請求項3】 にんにくを脱皮、水洗し、細切して低温乾燥して得られる乾燥にんにくを加熱して得られる、にんにく加工品を有効成分とする脂質代謝促進剤。

【請求項4】 にんにくを酵素失活した後、水又は希エタノールで抽出し、吸脱着後粉末とした抽出物を加熱して得られる、にんにく抽出成分を有効成分とする脂質代謝促進剤。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明はにんにく精油成分、アリルスルフィド化合物及びアリルスルフィド化合物を多く含有するにんにく加工品又はにんにく抽出成分を有効成分とする脂質代謝促進剤及び脂質代謝促進用食品に関する。

【0002】

【従来の技術】にんにくは人類によって最も古くから利用されてきた香辛料の一つであり、現在も世界中で広く栽培され、利用されている。またにんにくは滋養強壮薬として古来より知られており、その効果としては強壮、強精、抗風邪、抗結核、抗寄生虫、抗痔疾症、化粧作用などが知られており、食用とするほか、灸や浴用としても用いられている。

【0003】

【発明が解決しようとする課題】肥満症は多くの場合脂肪組織特に皮下の脂肪組織部分に中性脂肪が異常に異常に蓄積し、体重が骨格系或いは生理機能の限界以上に増加した状態であり、脂質代謝がうまく行なわれていない結果である。一般に標準体重の20%以上増加している。脂肪が蓄積する皮下脂肪組織は胸部、大腿部、腹部などである。肥満の原因としては外因性又は単純性のものが多く、過食と運動不足にその責が着せられる。

【0004】現代の生活様式は過食の機会が多く、反対に運動の機会が少なく、したがってエネルギーの消費量が少ない。このことから脂肪代謝がうまく行なわれず、中性脂肪の異常な蓄積を引き起こし、これが肥満症の原因の一つとなる。一方肥満症は劣等感やストレスなどによって悪循環を来すと言われ、糖尿病、冠上動脈硬化症、胆石症、脂肪肝、腎臓症などの疾患を合併症として起し易い。

【0005】以上により肥満症を改善することは重要課題であるが、薬剤投与による肥満症の改善は習慣性、医原性中毒、腎合併症の恐れがあり、これから見ても従来は有用な医薬品が開発されていないのが現状である。

【0006】このことから日々の食生活の中で簡単に摂取し、脂質代謝促進による肥満症の改善に寄与できる方

法の開発が望まれている。そのため本発明者らは先に抗肥満剤として、にんにく加工品及びにんにく抽出成分について、特許出願（特願平3-222498）を行なった。

【0007】

【課題を解決するための手段】本発明者らはさらに研究を重ねてにんにく精油成分、にんにく加工品及びにんにく抽出成分の一つであるアリルスルフィド化合物により交感神経系の活動が惹起され、カテコラミン（エピネフィリン、ノルエピネフィリン）分泌を亢進させ脂質代謝を促進させることを見出した。

【0008】本発明は先の特許出願のにんにく加工品及びにんにく抽出成分を加熱することにより、アリルスルフィド化合物が増加することによって、抗肥満効果が著しく高くなることを発見して、本発明を完成した。

【0009】

【作用】本発明によって得られる効果を以下のカテコラミン分泌促進に関する実験例によって説明する。

【0010】実験例1. 4週令のSD系雄ラットに乾燥粉末状のにんにく加工品及びにんにく抽出成分を各々0.8%添加した高脂肪食をコントロール食（にんにくを添加しない高脂肪食）と共にペアーフィーディングで28日間投与した。投与後、ラットをウレタン- α -クロラロースで麻酔し、腹部大動脈より採血を行なった。血中カテコラミン分泌量は電気化学検出器を接続した高速液体クロマトグラフィーを用い、内部標準法によって測定を行なった。

【0011】測定の結果、カテコラミン分泌量はコントロール食群に対してにんにく加工品、にんにく抽出成分食群ともに高い値を示す傾向が見られた。

【0012】実験例2. 体重210~230gのSD系雄ラットをウレタン- α -クロラロースで麻酔し、にんにく加工品を0.12g含むにんにく加工品溶液及びにんにく抽出成分を0.12g (a)、0.24g (b)あるいは0.36g (c)含む3種類のにんにく抽出成分溶液を各々ベヒクルと共に大腿静脈より注入し、10分後腹部大動脈より採血を行なった。なお、にんにく加工品溶液及びにんにく抽出成分溶液 (a) はラットのにんにく1日摂取量に相当する量を含む、血中カテコラミン分泌量の測定方法は実験1と同様である。

【0013】測定の結果は表1のとおりであり、血中カテコラミン分泌量はノルエピネフィリン分泌量についてはベヒクルに対して高くなる傾向が見られた。またにんにく抽出成分溶液の注入により、ノルエピネフィリン分泌量において、(b)及び(c)ではベヒクルに対して有意に高い値を示した。またその投与量に比例して (a) < (b) < (c) の順に高い値を示し、これらは危険率1%以下で有意な相関関係のあることも認められた。またフェントラミン投与により交感神経活動を遮断したラットに対して同様の実験を行なった結果、にんに

く加工品及びにんにく抽出成分溶液の注入による血中カ * 【0014】

テコラミン分泌量亢進は認められなかった。 * 【表1】

ラット血中カテコラミン分泌に関するにんにく加工品及びにんにく抽出成分の
効果 (数値は平均±標準誤差)

	ノルエピネフィリン (ng/ml)	エピネフィリン (ng/ml)
ベヒクル	0.996±0.158	1.128±0.330
にんにく加工品	1.505±0.429	4.755±0.931*
にんにく抽出成分		
a (0.12g)	0.991±0.239	1.367±0.779
b (0.24g)	1.953±0.265*	1.538±1.052
c (0.36g)	3.380±0.786**	5.310±1.280**

* p<0.01 ** p<0.05

【0015】実験例3. 体重210~230gのSD系雄ラットをウレタン-αクロラロースで麻酔し、ジアリルモノスルフィド、ジアリルジスルフィド及びジアリルトリスルフィドの各溶液について、各々10mmolを 20ベヒクルと共に大腿静脈より注入し、10分後腹部大動脈より採血を行なった。血中カテコラミン分泌量の測定方法は実験1と同様である。

※コラミン分泌量はノルエピネフィリン分泌量についてはベヒクルに対してジアリルジスルフィド及びジアリルトリスルフィドにおいて有意に高い値を示した。またノルエピネフィリン分泌量とアリルスルフィド化合物との関係は、そのアリルスルフィド化合物に含まれる硫黄原子数に比例的にノルエピネフィリン分泌量が高くなること

が示された。

【0017】

【0016】測定の結果表2のとおりであり、血中カテ※ 【表2】
ジアリルスルフィド化合物の静脈注入効果 (数値は平均±標準誤差)

	ノルエピネフィリン (ng/ml)	エピネフィリン (ng/ml)
ベヒクル	0.772±0.645	4.403±2.473
ジアリルモノスルフィド	0.513±0.282	10.375±7.717
ジアリルジスルフィド	1.279±0.303	2.550±0.930
ジアリルトリスルフィド	2.185±0.309	5.682±1.183

【0018】実験例4. 体重210~230gのSD系雄ラットをウレタン-αクロラロースで麻酔し、ジアリルジスルフィドを0.55mg、1.10mg又は1.64mgを含む3種類の溶液を各々ベヒクルと共に大腿静脈より注入し、10分後腹部大動脈より採血を行なった。なおジアリルジスルフィドを0.55mg含む溶液 40は、ラットのにんにく平均1日摂取量にほぼ相当する量を含む。血中カテコラミン分泌量の測定方法は実験1と同様である。

【0019】測定の結果血中カテコラミン分泌量は、1.10mg及び1.64mgの注入ではベヒクルに対して有意に高い値を示した。またノルエピネフィリン分泌量はジアリルジスルフィドの投与量に比例して、0.55mg<1.10mg<1.64mgの順に高い値を示し、これらは危険率0.1%以下で有意な相関関係のあることも認められた。またフェニトラミン投与により交感神経系★50

★活動を遮断したラットに対して同様の実験を行なった結果、ジアリルジスルフィドの注入による血中カテコラミン分泌亢進は認められなかった。

【0020】以上により、高脂肪食摂取ラットに対するにんにく精油成分及びにんにくの投与はそれの中に含まれるアリルスルフィド化合物によって、ラットの末梢の交感神経系活動を惹起させ、カテコラミン分泌を亢進させ、これが脂質代謝を促進させているものと考えられる。

【0021】なお下記の実施例3及び4で得た各物質は従来品に比べてアリルスルフィド化合物を多く含んでおり、これらについても脂質代謝の促進作用が推察された。

【0022】実験例5. 後記の実施例3で得たにんにく加工品及びにんにくフレーク (コントロール) についてガスクロマトグラフィーを行ない、ヘッドスペースベ

ーバーについて比較検討した結果、表3に示すようににんにく加工品はコントロールに対してジアリルスルフィド類を多く含んでいることが明らかであった。*

にんにく加工品のジアリルスルフィド化合物

	コントロール	にんにく加工品
ジアリルモノスルフィド	761	17237(22.7)
ジアリルジスルフィド	1336	2161(1.6)
ジアリルトリスルフィド	523	836(1.6)

()内はにんにく加工品/コントロールを示す。

【0024】実施例6. 後記の実施例4で得たにんにく抽出成分及び市販の無臭にんにく末(コントロール)についてガスクロマトグラフィーを行ない、ヘッドスペースペーパー及びn-ヘキサン抽出部について比較した*

※結果、表4に示すようににんにく抽出成分はいずれの場合もコントロールに比べてジアリルスルフィド類を多く含んでいることが明らかであった。

にんにく抽出成分のジアリルスルフィド化合物

	ヘッドスペース		n-ヘキサン抽出部	
	コントロール	にんにく抽出成分	コントロール	にんにく抽出成分
ジアリルモノスルフィド	154	2998(19.1)	-	1273
ジアリルジスルフィド	228	2472(10.8)	157	2271(14.5)
ジアリルトリスルフィド	133	1036(7.8)	141	3625(27.1)
ジアリルトテラスルフィド	-	-	-	544

()内はにんにく抽出成分/コントロールを示す。

【0026】

【実施例】

実施例1. 脱皮、水洗、スライスし水蒸気蒸留を行なった蒸留液を溶媒抽出し、溶媒を除去し、にんにく精油を得た。本品の急性毒性試験はマウスによる経口投与でLD₅₀=420mg/kgであった。

【0027】実施例2. 実施例1で得たにんにく精油を減圧蒸留又はカラムクロマトグラフィーを行なうことにより、精製されたアリルスルフィド化合物を得た。ジアリルジスルフィドの急性毒性試験はマウスによる経口投与でLD₅₀=320mg/kgであった。

【0028】実施例3. 脱皮、水洗、スライスし、比較的低温にて乾燥して製造されたにんにくフレークを110~120℃にて加熱する。冷後、粉碎、篩別して乾燥粉末であるにんにく加工品を得た。本品の急性毒性試験

★験はラットによる経口投与でLD₅₀=40g/kg以上であった。

30 【0029】実施例4. 脱皮、水洗、酵素を熱失活させたにんにくに30%程度のエタノールを加えて抽出したもののについて、活性炭などによる吸脱着を行ない、減圧濃縮し、さらに乾燥することによって得られた粉末を90~105℃にて加熱し、冷後、粉碎、篩別して乾燥粉末であるにんにく抽出成分を得た。本品の急性毒性試験はラットによる経口投与でLD₅₀=40g/kg以上であった。

【0030】

【発明の効果】本発明によって、にんにく精油とその中に含まれるアリルスルフィド化合物及びアリルスルフィド化合物を多量に含まれるにんにく加工品又はにんにく抽出成分に脂質代謝促進作用を見出し、副作用もなく、有効な脂質代謝促進剤を製造できる。